Characteristics of U.S. Rice Farming

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Abstract: This paper uses data from the 1997 Census of Agriculture to provide an overview of the structure of rice farming in the United States. The paper focuses on farm size and number, value of production, operator profiles, farm ownership, and the level of capital investment. Comparisons among States, other commodities, and previous Censuses are provided.

Keywords: Rice, farm size, farm numbers, operator profile, capital value, yields.

There are a variety of changes occurring in the U.S. rice industry. Many of the changes reflect broad adjustments that are happening throughout the agricultural sector. For example, average farm size and yields continue to increase for rice farming as well as for virtually every other major commodity in the United States. Other changes, including the decline in rice production along the Gulf Coast and greater rice plantings in Missouri and northern Arkansas, are also happening.

This paper uses data from the 1997 Census of Agriculture to provide an overview of the structure of the U.S. rice farming sector and highlights changes from past census reports. The paper focuses on farm size and number, the value of rice production, operator profiles, and levels of capital investment. Comparisons between States producing rice and among different commodities are also provided. Unless otherwise noted, this paper considers a rice farm to be a farm where rice is grown. The Census of Agriculture also reports information for farm enterprises using the North American Industrial Classification System (NAICS). NAICS defines a rice farm as one where 50 percent or more of the farm's total value of agricultural sales comes from rice.

U.S. Rice Crop Valued at Nearly $1.8 Billion in 1997

According to the U.S. Department of Agriculture's (USDA) National Agricultural Statistics Service, the total value of U.S. rice production in 1997 was nearly $1.8 billion, making rice the eighth most valuable field crop grown in the Nation. In 1997, there were 9,291 farms that grew rice out of slightly more than 1.9 million farms in the United States. Rice accounted for about 2 percent of the total value of field crops produced in the United States. Arkansas accounted for about 45 percent of the total value of rice production.

Almost all of the U.S. rice crop is produced in six States: Arkansas, California, Louisiana, Mississippi, Missouri, and Texas. Most of the analysis for this paper focuses on these six States. Other States that produce rice include Florida, Oklahoma, South Carolina, and Tennessee. Although rice is produced in relatively few regions, it is an important crop in those communities where it is grown. Rice is most important in Arkansas and Louisiana where in 1997 it accounted for 31 percent and 18 percent of each State's total value of crop production. Mississippi ranks a distant third, with rice accounting for more than 9.5 percent of the State's crop value, followed by Texas at about 3 percent. Rice accounts for only about 2 percent of total crop value in California and Missouri.

Based on the value of all farm sales, the largest number of farms producing rice were in the $100,000-$249,000 category (table A-1). In 1997, there were 2,939 farms in this category, and they accounted for almost 32 percent of all farms with rice. Farms with annual sales of $250,000-$499,999 ranked second, with 2,387 farms, and accounted for one-fourth of all farms with rice. Farms with annual sales below $50,000 accounted for less than 12 percent of all rice producing farms, down from more than 19 percent in 1992.

Table A-1--Distribution of U.S. farms growing rice by value of all farm sales

Value of sales	1997		1992	
	Farms	Share of total	Farms	Share of total
	Number	Percent	Number	Percent
up to $19,999	386	4.2	928	8.3
$20,000 to $49,999	675	7.3	1,234	11.0
$50,000 to $99,999	1,083	11.7	1,945	17.3
$100,000 to $249,000	2,939	31.6	3,925	35.0
$250,000 to $499,999	2,387	25.7	2,047	18.3
$500,000 to $999,999	1,278	13.8	852	7.6
$1 million or more	543	5.8	281	2.5
Total	9,291	100	11,212	100

Source: U.S. Census of Agriculture, 1997 and 1992.

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The number of farms with annual sales of less than $250,000 declined nearly 37 percent between 1992 and 1997. The share of all farms with rice declined to 55 percent in 1997, from nearly 72 percent in 1992. In contrast, the number of farms in the higher sales value categories increased. The number of farms with sales values of $1 million or more increased more than 93 percent to 543 in 1997 and accounted for nearly 6 percent of all rice-producing farms. Farms with sales values of $500,000-$999,999 increased 50 percent to 1,278. Farms with sales of $250,000-$499,999 increased almost 17 percent between 1992 and 1997, rising to 2,387.

Farms with Rice Decline 17 Percent Between 1992 and 1997

A major trend in the U.S. rice industry has been a decline in the total number of farms that grow rice and an increase in average farm size. This trend is occurring throughout the agricultural sector and is a result of significant improvements in the productivity of farm operators, and the economies of size associated with agricultural production.

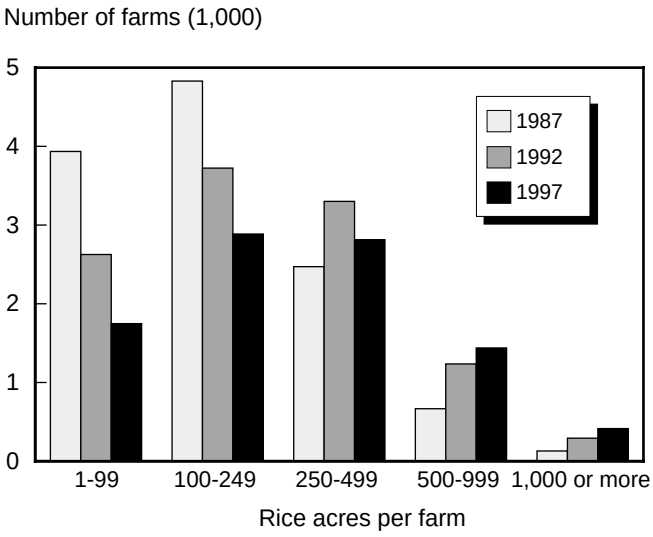
In 1997, the Census of Agriculture reported 9,291 U.S. farms that produced rice on more than 3.1 million acres (table A-2). The number of farms producing rice has declined significantly since 1987. In 1987, there were 12,013 rice-producing farms. By 1992, the number had dropped to 11,212. The reduction is more pronounced for rice than for farming in general. In 1997, there were about 1.9 million farms in the United States, down about 8 percent from 1987.

As farm numbers were declining, average rice acreage was growing. The number of rice acres on a farm that grew rice averaged 336 in 1997, up from 202 in 1987. During the same period, average farm size in the United States as a whole expanded more than 5 percent to 487 acres.

The rice sector tends to be dominated by a relatively few large producers, and large farms have become more prominent over the past decade. The number of farms with 500 acres of rice or more increased in each census since 1987. By contrast, the number of farms with less than 250 rice acres decreased over the same period. The number of rice-producing farms with 250-499 acres of rice increased between 1987 and 1992, but decreased between 1992 and 1997.

Figure A-1

The number of farms with 500 or more acres of rice have increased substantially since 1987



Source: U.S. Census of Agriculture.

Although large farms in general are increasing in number, very large farms are growing at a particularly fast rate. In 1987, the U.S. Census reported 128 farms that exceeded 1,000 acres of rice, which accounted for about 8 percent of total production. By 1997, there were 414 farms with over 1,000 acres of rice—an increase of 223 percent—that accounted for 20 percent of production. Between 1987 and 1997, farms in the 500-999 rice-acre category increased by 117 percent and farms in the 250-499 rice-acre category increased almost 14 percent.

Over the same period, the number of small farms with rice—those with fewer than 100 acres of rice—declined sharply. The 1987 Census reported 3,928 rice-producing farms with fewer than 100 acres of rice. They accounted for about 8 percent of total production. By 1992, the number of

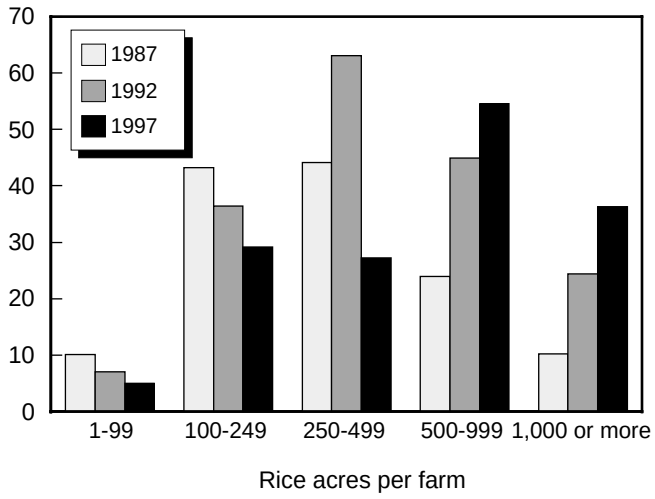
Table A-2--Farms growing rice: Number, acres, production, and yield

Harvested acres of rice	1997				1992				1987			
	Farms	Number of rice acres	Production	Avg. yield	Farms	Number of rice acres	Production	Avg. yield	Farms	Number of rice acres	Production	Avg. yield
	Number	Acres	1,000 cwt	Pounds	Number	Acres	1,000 cwt	Pounds	Number	Acres	1,000 cwt	Pounds
1-99	1,747	90,180	5,051	5,601	2,620	134,587	7,115	5,287	3,928	197,941	10,134	5,119
100-249	2,885	492,598	29,161	5,920	3,722	634,961	36,379	5,729	4,825	798,122	43,232	5,417
250-499	2,812	983,203	57,237	5,821	3,296	1,130,817	63,090	5,579	2,472	822,462	44,148	5,368
500-999	1,433	934,222	54,494	5,833	1,232	804,740	44,942	5,585	660	426,504	24,007	5,629
1,000 or more	414	621,917	36,288	5,835	292	412,613	24,415	5,917	128	179,835	10,195	5,669
Total	9,291	3,122,120	182,231	5,837	11,212	3,117,718	175,942	5,643	12,013	2,424,864	131,716	5,432

Source: U.S. Census of Agriculture, 1997, 1992, and 1987.

Figure A-2

Farms with 500 or more acres of rice account for nearly half of U.S. rice production



Source: U.S. Census of Agriculture.

rice-producing farms in the same category dropped to 2,620 and by 1997 had declined to 1,747, accounting for less than 3 percent of total production. Following a similar pattern, the number of farms in the 100-249 rice-acre category declined 40 percent between 1987 and 1997 and accounted for about 16 percent of total production.

The average yield for rice in 1997 was reported at 5,837 pounds per acre. In the 1997 Census, farms in the 100-249 rice-acre category reported the highest average yield of 5,920 pounds per acre. Farms with less than 100 acres of rice reported the lowest average yield, 5,601 pounds per acre. This pattern is somewhat different from what was reported in previous census reports. In the 1992 and 1987 Census, the largest rice-producing farms—those with 1,000 acres of rice or more—had the highest yields of any category, and the smallest farms—those with fewer than 100 acres of rice—had the lowest yields. In general, we would expect larger farms to have higher yields because they are more likely to utilize yield-enhancing technologies such as precision leveling and straight or permanent levees.

The number of farms and rate of decline in number varies among the six major rice-producing States (table A-3). In 1997, Arkansas reported 4,207 farms that grew rice, more than any other State but down 25 percent from 1987. Louisiana and California ranked next with 1,736 and 1,544 rice-producing farms. Since 1987, the number of farms that grow rice has dropped almost 7 percent in California and 24 percent in Louisiana. No other State had more than 1,000 rice-producing farms. Missouri—which reported 418 farms with rice in 1997—has the fewest, due to a limited area suitable for growing rice. Although the number of rice-producing farms in Missouri has fallen since 1987, overall production there has increased sharply over the past decade. The number of rice farms has declined as production technology has improved, enabling fewer growers to farm more land.

The average rice acreage of rice-producing farms in 1997 was 336 acres. However, average farm sizes vary among the major rice-producing States. In Mississippi, rice-producing farms averaged 442 acres of rice in 1997, up from 243 in 1987 and the highest average in the United States. The smallest average rice acreage in the country is in Missouri, where rice-producing farms averaged 281 acres of rice, up from 148 in 1987. In the four other major rice-growing States, average rice area was very similar, ranging from 329 acres in Arkansas to 334 in Louisiana.

Rice Producing Farms Are Larger Than Most Crop Farms

Rice acreage on farms that grow rice tends to be larger than the specific crop acreage of other commodity farms. Rice-producing farms averaged 336 rice acres in 1997, compared with 162 acres of corn for corn producing farms, 242 acres of wheat for wheat producing farms, and 186 acres of soybeans for soybean producing farms (table A-4). Among

Table A-3--Farms growing rice by State: Number, share, and average size

	1997			1992			1987		
State	Farms	Share of U.S. rice crop	Average size	Farms	Share of U.S. rice crop	Average size	Farms	Share of U.S. rice crop	Average size
	Number	Percent	Acres	Number	Percent	Acres	Number	Percent	Acres
Arkansas	4,207	43.3	329	4,924	42.9	277	5,613	41.5	186
Louisiana	1,736	14.5	334	2,197	15.3	268	2,273	13.6	184
Mississippi	530	7.3	442	748	8.9	362	803	7.9	243
Missouri	418	3.4	281	475	2.9	216	449	2.6	148
Texas	843	8.4	333	1,276	11.4	290	1,212	12.4	247
South	7,734	77.0	336	9,620	81.3	280	10,350	78.1	195
California	1,544	22.7	333	1,575	18.1	255	1,654	21.7	241
Total 1/	9,291	100	336	11,212	100	278	12,013	100	202

1/ Includes some rice farms in minor rice producing States, primarily Florida, Oklahoma, South Carolina, and Tennessee.

Source: U.S. Census of Agriculture, 1987, 1992, and 1997.

major field crops, only cotton—at 420 acres—reported a larger average acreage than rice.

In 1997, the average per-farm value of land and buildings for rice farms (using the NAICS farm definition) averaged nearly $1.1 million compared with $545,000 for soybeans, $590,000 for wheat, and $783,000 for corn (table A-5). Cotton production also incurs relatively high fixed costs, and these producers reported per-acre land and buildings values at about the same as rice.

Rice is a capital-intensive crop as demonstrated by the value of land, buildings, machinery, and equipment. In fact, except for cotton, among field crops rice had the highest per-farm machinery and equipment expenses. In 1997, average per-farm expenses for machinery and equipment for rice totaled $176,000 compared with $78,000 for soybeans, $101,000 for wheat, and $105,000 for corn. For cotton, expenses for machinery and equipment averaged $184,000 per farm.

Part-Owners and Tenants Account For Majority of Farms with Rice

The Census of Agriculture provide data for farms with different tenant relationships using the following definitions. Full owners only operated land they owned. Part owners operated land that they owned but also land that they rented from others. Tenants operated only land that they rented from others or worked on shares for others.

A much smaller proportion of rice producing farms are operated by full-owners as compared with both the overall farm sector and other field crops. For farms in general, full-ownership accounts for 60 percent of the total number of farms, part-owners account for 30 percent, and tenants account for just 10 percent.

This pattern is very different for both rice and other major field crops. For rice, the majority of farms are either part-owned or tenant farmed. The largest share of rice-producing farms, 42 percent, are operated by part-owners, about the same as in 1992 (table A-6). As a share of total production, part-owners accounted for 45 percent of total rice production in 1997, up slightly from 1992.

Tenant farms were the second most common type of farm operation, accounting for 37 percent of all farms with rice and 38 percent of harvested area. The share of farms operated by tenant farmers is significantly higher for rice than for other commodities, although it is slightly lower than reported in 1992.

Full-ownership is the least common tenure class among rice producers, accounting for less than 21 percent of all rice-producing farms and just over 16 percent of rice acreage. This level of full-ownership is smaller than for other major food and feed grains, although it has increased since 1992.

In 1997, tenant farmers reported the highest average rice yield of 5,939 pounds per acre, followed by full-owners at 5,902 pounds. Part-owners reported the lowest average yield among tenure classes at 5,727 pounds. The pattern was slightly different in 1992 when full-owners had the highest average yield, followed by tenant farmers and then part-owners.

Data on rice producers by principle occupation of the operator indicate that about 88 percent of rice producers were categorized as “farmers” (the operator spent 50 percent or more

Table A-4--Farm and ownership characteristics of selected commodities, 1997

	Rice	Wheat	Corn	Cotton	Soybeans	All farms
Number of farms	9,291	243,568	430,711	31,493	354,692	1,911,859
Total harvested acreage (1,000 acres)	3,122	58,836	69,797	13,235	66,148	931,795
Average acreage of specified commodity (acres)	336	242	162	420	186	487
Tenure (percent of total)						
Full-owner	21	29	35	25	32	60
Part-owner	42	57	51	51	52	30
Tenant	37	14	14	24	16	10

Source: U.S. Census of Agriculture, 1997.

Table A-5--Characteristics of farm enterprises by commodity, 1997 1/

Characteristics	Rice	Wheat	Corn	Cotton	Soybeans	All farms
			$1,000			
Per-farm value of land and buildings	1,097	590	783	1,091	545	450
Per-farm value of machinery and equipment	176	101	105	184	78	58

1/ The definition of a farm enterprise is based on the North American Industry Classification System.

Source: U.S. Census of Agriculture, 1997.

of his/her time working on the farm), virtually unchanged between 1992 and 1997 (table A-7). Operations where the farmer spent more than 50 percent of their time on the farm accounted for about 94 percent of the total acreage planted to rice, also unchanged from the previous census.

The average age of rice producers is increasing. In 1987, there were 2,821 rice growers, both part-time and full-time, in the 35-44 year-old category. This was the largest age category, accounting for over 23 percent of all rice producers. By 1997, the 45-54 year olds were the largest age category and they accounted for more than 28 percent of all rice growers. In 1987, rice producers under age 45 accounted for more than 45 percent of all farms with rice. But by 1997 only 36 percent of farmers were under age 45. In contrast, growers over age 45 accounted for 64 percent of all rice operations in 1997, up from 55 percent in 1987.

Summary

This paper provides a general overview of the U.S. rice farming sector using data from the 1997 Census of Agriculture. Economic Research Service (ERS) analysis indicates that many of the trends noted are likely to continue. It is expected that rice production will continue to decline on the Gulf Coast due to relatively high production costs and urban encroachment (data for farm costs and returns can be found on the ERS web site at *http://www.ers.usda.gov/data/costsandreturns/*). It is also expected that farm sizes will continue to increase throughout the agricultural sector as labor-saving technologies are developed and economies of scale expand.

Table A-6--Ownership characteristics of farms growing rice

Tenure	1997				1992			
	Farms	Harvested area	Annual production	Average yield	Farms	Harvested area	Annual production	Average yield
	Number	Acres	1,000 cwt	Pounds/acre	Number	Acres	1,000 cwt	Pounds/acre
Full-owner	1,940	511,070	30,165	5,902	2,186	395,154	23,212	5,874
Part-owner	3,881	1,418,707	81,256	5,727	4,550	1,352,786	74,259	5,489
Tenant	3,470	1,192,343	70,811	5,939	4,476	1,369,778	78,470	5,729
Total	9,291	3,122,120	182,231	5,837	11,212	3,117,718	175,942	5,643
				Percent				
Full-owner	21	16	17	101	19	13	13	104
Part-owner	42	45	45	98	41	43	42	97
Tenant	37	38	39	102	40	44	45	102

Source: U.S. Census of Agriculture, 1992 and 1997.

Table A-7--Farms growing rice: Numbers and size by operator age

Operator age	1997		1992		1987	
	Farms	Acreage	Farms	Acreage	Farms	Acreage
	Number	Acres	Number	Acres	Number	Acres
Primary occupation:						
Farming 1/						
Under 25	165	37,308	230	51,768	422	66,764
25 to 34	845	266,281	1,403	372,971	1,981	391,133
35 to 44	2,017	748,920	2,577	786,703	2,458	563,917
45 to 54	2,312	869,609	2,371	759,451	2,434	539,553
55 to 64	1,677	611,061	1,914	579,598	2,172	473,796
65 and over	1,166	397,612	1,346	373,128	1,143	236,766
Total	8,182	2,930,791	9,841	2,923,619	10,610	2,271,929
Non-farming 2/						
Under 25	13	888	15	1,708	39	3,053
25 to 34	108	14,224	144	20,715	172	20,621
35 to 44	238	42,733	291	35,468	363	42,225
45 to 54	333	57,185	428	62,424	346	35,854
55 to 64	224	37,153	278	40,341	284	27,315
65 and over	193	39,146	215	33,443	199	23,867
Total	1,109	191,329	1,371	194,099	1,403	152,935

1/ Operator spends 50 percent or more of their time farming. 2/ Operator spends less than 50 percent of their time farming.

Source: U.S. Census of Agriculture, 1987, 1992, and 1997.

The Census of Agriculture

In the Census of Agriculture, a farm is defined as any place from which $1,000 or more of agricultural products were produced or sold or normally would have been sold during the census year. The Census of Agriculture provides a statistical snapshot of the Nation's farming and ranching industries and is the principle source of comparable data at the county and State levels. Census statistics are used by Congress to develop and change farm programs, study historical trends, assess current conditions, and plan for the future. Many State and Federal programs are designed and evaluated using data from the Census of Agriculture. The private sector uses census data for many activities as well.

The first agricultural census was taken in 1840 as part of the Sixth Decennial Census of the population. From 1840 to 1950, the agricultural census was taken as part of each decennial census. From 1954 to 1974, a Census of Agriculture was taken for the years ending in 4 and 9. In 1976, Congress authorized the Census of Agriculture to be taken for 1978 and 1982 to adjust the data reference year so that it coincided with other economic censuses. This adjustment in timing established the agriculture census on a 5-year cycle, collecting data for years ending in 2 and 7.

The U.S. Department of Commerce, Bureau of the Census, conducted the census for more than 150 years. However, the 1997 Appropriations Act transferred the responsibility from the Bureau of the Census to the National Agricultural Statistics Service (NASS) of the U.S. Department of Agriculture. The 1997 census was the first conducted by NASS. The 1997 and 1992 censuses can be viewed on-line at *http://www.nass.usda.gov/census.*